

AMENDMENTS TO THE SPECIFICATION

Please amend specification pages 4-8 as follows:

The present invention will be described in relation to a reciprocating compressor driven by a linear motor of the type used in refrigeration systems and comprising a motor-compressor assembly, including a non-resonant assembly formed by a linear motor and a cylinder 1, and a resonant assembly formed by a piston 2 reciprocating inside the cylinder 1, and an actuating means 3, external to the cylinder 1 and carrying a magnet 4 that is axially impelled upon energization of the linear motor, said actuating means 3 operatively coupling the piston 2 to the linear motor.

According to the prior art construction illustrated in FIGS. 1 and 2, the components mentioned above are mounted inside a hermetic shell [[10]] 100.

As illustrated in the enclosed figures, the linear motor is mounted around the cylinder [[1]] 101 and the piston [[2]] 102 and comprises a stack of internal laminations [[5]] 105 with a coil [[6]] 106 inserted therein, and a stack of external laminations [[7]] 107.

In the construction illustrated in FIGS. 1 and 2, the compressor also includes conventional resonant spring means, mounted in constant compression to the resonant assembly and to the non-resonant assembly, and which are elastically axially deformable in the displacement direction of the piston [[2]] 102.

In the construction of FIG. 1, the compressor comprises a spring means, in the form of an assembly of flat springs [[10]] 120 made of a spring steel plate and to which is mounted the piston [[2]] 102 through a flexible rod [[8]] 108.

In the embodiment of FIG. 2, the compressor comprises a pair of spring means, for example a pair of helical springs [[20]] 130, a first helical spring [[20]] 130 mounted between the actuating means [[3]] 103 and the cylinder [[1]] 101, and a second helical spring [[20]] 130 mounted between said actuating means [[3]] 103 and the shell [[10]] 100 of the compressor.

According to the illustrations, the cylinder [[1]] 101 has an end closed by a valve plate [[30]] 140, provided with a suction valve [[31]] 141 and a discharge valve [[32]] 142, which allows the selective fluid communication between a compression chamber [[9]] 109 defined between a top portion of the piston [[2]] 102 and the valve plate [[30]] 140 and respective internal portions of a cylinder head [[40]] 150 that are respectively maintained in fluid communication with the low and high pressure sides of the refrigeration system to which the compressor is coupled.

These constructions present the disadvantages discussed above.

According to the present invention, the prior art disadvantages are avoided with a resonant arrangement for a linear compressor that comprises at least one spring means presenting an elongated tubular body [[50]] 60, which is coaxial to the axis of the piston 2 and has an end [[51]] 61 operatively coupled to the actuating means 3, and an opposite end [[52]] 62 operatively coupled to the non-resonant assembly, said tubular body [[50]] 60 having at least part of its extension folded in circumferential sectors [[53]] 63 that are symmetric in relation to the axis of said tubular body [[50]] 60, and for example, orthogonal to the axis of the piston 2, each circumferential sector [[53]] 63 being elastically deformed in the axial direction upon the displacement of piston 2.

According to a way of carrying out the present invention, the circumferential sectors [[53]] 63 present the same cross section profile, for example a substantially "V" shaped profile, such as illustrated in FIG. 5, or a substantially "U" shaped profile.

In the construction illustrated in which the circumferential sector [[53]] 63 has a "V" shaped profile, the elastic deformation of each said circumferential sector [[53]] 63 upon displacement of the piston occurs by variation of its respective dihedral angle.

Although in the illustrated constructive alternative the circumferential sectors [[53]] 63 present the same dihedral angle, it should be understood that the solutions in which the circumferential sectors [[53]] 63 present different cross section profiles along the longitudinal extension of the tubular body [[50]] 60 and different dihedral angles to said circumferential sectors [[53]] 63 are also possible.

According to a way of carrying out the present invention, the tubular body is hollow, allowing for the fluid communication between the compression chamber 9 and the interior of the shell 10, which in this case is of the conventional hermetic type.

In the embodiment of the invention, as illustrated, the tubular body [[50]] 60 presents a non-hollow lateral surface [[54]] 64. In this case, since an end [[51]] 62 of the tubular body [[50]] 60 is hermetically affixed to the cylinder 1, and the opposite end [[52]] 61 is hermetically affixed to the actuating means 3, said tubular body [[50]] 60 blocks the fluid communication between the compression chamber 9 and the exterior of cylinder 1 through gaps existing between the piston 2 and the cylinder 1. In this construction, the shell of the compressor, if provided, does not need to be hermetic, since the sealing between the compression chamber 9 and the interior of said shell is obtained by the tubular body [[50]] 60.

According to the illustration in FIG. 3, the compressor further presents another spring means in the form of a tubular body [[50]] 60, having an end [[51]] 61 affixed to the actuating means 3, and the other end [[52]] 62 affixed to the shell 10. The fixation of each of the ends [[51, 52]] 61, 62 of each tubular body [[50]] 60 to the respective parts defined by the cylinder 1, the actuating means 3, and the shell 10 is achieved for example, by one of the processes of welding, gluing or screwing.

In a form of executing the invention, each of the ends [[51, 52]] 61, 62 of each tubular body [[50]] 60 is defined by a respective tubular extension not presenting the circumferential sectors [[53]] 63 and which is dimensioned to provide a fitting to the respective part to which it is affixed. However, other constructive forms for said ends [[51, 52]] 61, 62 are possible, such as radial projections to be orthogonally affixed to the axis of the piston 2.

In the illustrated construction, each part to which is affixed an adjacent end [[51, 52]] 61, 62 of the tubular body [[50]] 60 is provided with at least one circumferential tooth that is coaxial to the axis of the piston 2 in order to fit said respective end [[51, 52]] 61, 62.

According to the illustrations in [[FIG. 3]] FIG. 4, a lower end portion of the cylinder 1 is provided with an annular cutting 1a, which defines the tooth for the fixation of an adjacent end [[51]] 62 of the tubular body [[50]] 60, and the actuating means 3 is provided with a first annular tooth 3a facing the cylinder 1 and securing the other end [[52]] 61 of the tubular body [[50]] 60.

In the construction presenting two spring means, such as illustrated in [[FIG. 4]] FIG. 3, the actuating means 3 is further provided with a second annular tooth 3b, facing a lower portion of the shell 10 in order to affix an end [[51]] 61 of other tubular body [[50]] 60. In this construction, the shell 10 presents a respective annular salience, which is coaxial and aligned in relation to the second tooth 3b of the actuating means 3 that secures the other end [[52]] 62 of the tubular body [[50]] 60. In the illustrated constructions, the circumferential teeth are continuous, coaxial and axially aligned to each other.